

# PATENT SPECIFICATION



Application Date: March 21, 1942. No. 3759/42.

556,012

Complete Specification Left: March 20, 1943.

Complete Specification Accepted: Sept. 16, 1943.

## PROVISIONAL SPECIFICATION

### Improvements in or relating to Filters

We, SCOTT MOTORS (SALTAIRE) LIMITED, a company organised under the laws of Great Britain, of Shipley, in the County of York, and WILLIAM CULL, a British subject, of the Company's address, do hereby declare the nature of this invention to be as follows:—

This invention relates to filters of the kind used for filtering or straining liquids such as lubricating oil, petrol or the like, wherein the filter comprises a removable filter element through which the liquid is passed or forced. Such filter elements have usually been built up of a plurality of finely spaced discs or plates with or without intermediate spacing members, whilst another construction has comprised finely spaced wire or rings rigidly held and mounted upon a former or core having apertures through which the filtered liquid is passed after having been forced through the wire or rings.

The chief object of the present invention is to provide a new or improved construction of filter element which will be easier to manufacture, and at the same time have an increased filtering efficiency.

According to the invention the filter element comprises a helical compression spring having a predetermined amount of metal deposited or removed at equal spaced intervals on each coil of the spring. When the filter element is placed in position in the filter it is compressed and the liquid being filtered passes through the spaces between adjacent coils afforded by either the removed metal or by the spaces resulting from the metal deposits.

In the case of metal being deposited, three equidistant deposits may be made on each coil so that when the spring is compressed the deposits are in line and adjacent one to another with the result three lines of metal appear to run axially from one end of the spring to the other.

In an embodiment of the invention the filter element comprises a helical compression spring preferably of suitable spring wire or similar material of either round rectangular or other cross-section. At equal spaced points or lengths around each coil, a coating of metal of predetermined thickness is deposited either before

or after the spring is coiled. In the former case, the metal will be deposited at predetermined intervals along the length of wire or similar material.

In an alternative construction instead of depositing metal on the wire, suitable amounts of metal may be removed say by grinding or etching the wire at predetermined intervals.

When the filter element is placed in the filter, it is fully compressed so that the liquid to be filtered is passed or forced from either the inside or outside of the element and the filtrate drawn off. The element may be used with or without a centrally disposed reticulated core for supporting it according to whether a weak or strong spring is used as the filter element, because if the spring shows any tendency to buckle, then a supporting core will be necessary.

When it is desired to clean the filter element it may be removed from the filter and when released the coils will spring open, thereby exposing the filtering surfaces for easy cleaning.

Cleaning could also be accomplished without dismantling the filter by fitting a central spindle passing through the gland provided at one end with a suitable handle or wheel for turning, and at the other end with a cam surface co-acting with a similar surface formed on one end cap of the filter element, the arrangement being such that say half a turn of the hand wheel allows the filter element to separate its coils and at the completion of the turn closes up the coils into the filtering position.

The degree of filtration is determined by the spaces afforded between adjacent coils which in turn is directly proportionate to the amount of metal either deposited or removed with the result that by varying the amount of metal deposited or removed on the filter element the degree of filtration may be controlled to within fine limits.

Dated this 20th day of March, 1942.  
JOHN E. WALSH & CO.,  
7, East Parade, Leeds, 1;  
also at Bradford and Halifax:  
Chartered Patent Agents.

[Price 1/-]

## COMPLETE SPECIFICATION

## Improvements in or relating to Filters

We, SCOTT MOTORS (SALTAIRE) LIMITED, a company organised under the laws of Great Britain, of Shipley, in the County of York, and WILLIAM CULL, a British subject, of the Company's address, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to filters of the edge type for use in filtering or straining liquid such as lubricating oil, petrol or the like, comprising a removable filter element consisting of a helical coil of wire formed with spaced cut out portions or protuberances to afford filtering passages when the convolutions of the coil are pressed into contact with one another. It has been previously proposed to wind a wire helically upon a supporting member or frame, the wire being subjected either at the time of its being wound or previously, to a process of deformation so that spaced indentations or protuberances are formed upon the sides of the wire. The chief object of the present invention is to provide a new or improved construction of this kind of filter element which will be easier and more economical to manufacture, and at the same time have an increased filtering efficiency.

According to the invention the filter element comprises a single wire in the form of a helical compression spring having a predetermined amount of metal circumferentially deposited or removed from the wire at equal spaced intervals on each coil of the spring. When the filter element is placed in position in the filter it is compressed and the liquid being filtered passes through the spaces between the adjacent coils afforded by either the removed metal or by the spaces resulting from the metal deposits.

In the case of the metal being deposited, three circumferential equidistant deposits may be made on the wire of each coil so that when the spring is compressed the deposits are in line and adjacent one to another with the result three lines of metal appear to run axially from one end of the spring to the other.

In order that the invention may be clearly understood and readily carried into effect, the same will now be more fully described with reference to and by the aid of the accompanying drawings, wherein:—

Figure 1 is an elevation of a fragmentary portion of a filter element consisting

of a helical spring formed from material having a predetermined amount of metal deposited thereon at equal spaced intervals.

Figure 2 is a plan of Figure 1.

Figure 3 is a similar view to Figure 1 showing the filter element compressed as when in use.

Figure 4 is a similar view to Figure 1 of a modification of the invention with metal removed from the helix at equal spaced intervals.

Figure 5 is a plan view of Figure 4.

Referring to the drawings, the filter element comprises a helical compression spring 1 of suitable spring wire of round section. At equal spaced lengths around each coil a circumferential coating of metal 2 of predetermined thickness is deposited around the wire either before or after the spring is coiled. In the former case, the metal 2 will be deposited at predetermined intervals along the length of wire.

In an alternative construction shown in Figure 4 instead of depositing metal around the wire, suitable amounts of metal may be removed circumferentially at equal spaced lengths 2 say by grinding or etching the wire at predetermined intervals.

When the filter element is placed in the filter, it is fully compressed so that the liquid to be filtered is passed or forced from either the inside or outside of the element and the filtrate drawn off. The element may be used with or without a centrally disposed hollow reticulated core (not shown) for supporting it according to whether a weak or strong spring 1 is used as the filter element; if the spring 1 shows any tendency to buckle, then a supporting core will be necessary.

When it is desired to clean the filter element it may be removed from the filter (not shown) and when released the coils will spring open, thereby exposing the filtering surfaces for easy cleaning.

Cleaning could also be accomplished without dismantling the filter by fitting a central spindle passing through a gland and provided at one end with a suitable handle or wheel for turning, and at the other end with a cam-surface co-acting with a similar surface formed on one end cap of the filter element, the arrangement being such that say half a turn of the handle or wheel allows the filter element to separate its coils and at completion of

the turn closes up the coils into the filtering position.

The degree of filtration is determined by the spaces afforded between adjacent coils which in turn is directly proportionate to the amount of metal either deposited or removed with the result that by varying the amount of metal deposited or removed on the filter element the degree of filtration may be controlled to within fine limits.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A filter of the type referred to wherein the filter element consists of a single wire in the form of a helical compression spring having a predetermined amount of metal deposited circumferentially around the wire at equal spaced

intervals on each coil of the spring.

2. A filter of the type referred to wherein the filter element consists of a single wire in the form of a helical compression spring having a predetermined amount of metal removed circumferentially around the wire at equal spaced intervals on each coil of the spring.

3. A filter according to either of the preceding claims, wherein the filter element is mounted around a central hollow reticulated supporting core.

4. A filter according to any of the preceding claims, having a filter element constructed, arranged and adapted to operate substantially as described with reference to the accompanying drawings.

Dated this 19th day of March, 1943.

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also at Bradford and Halifax:

Chartered Patent Agents.

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FIG. 1.

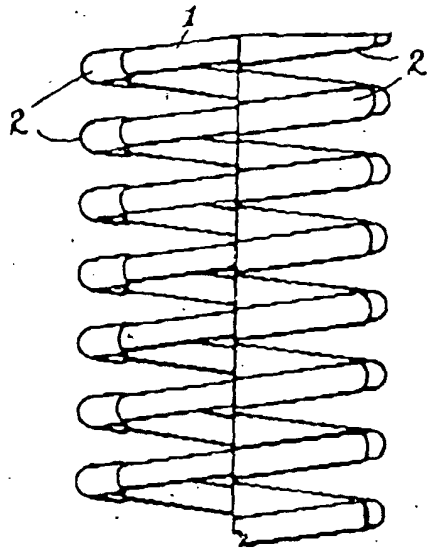


FIG. 4.

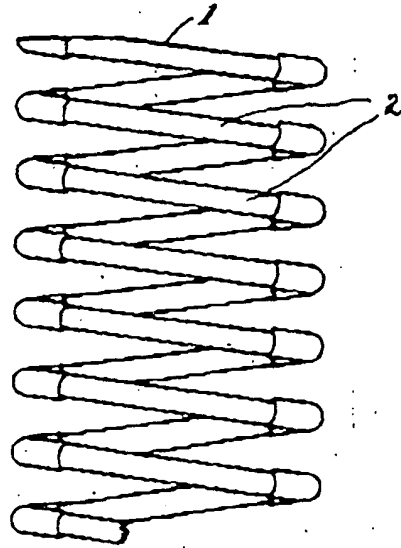


FIG. 2.

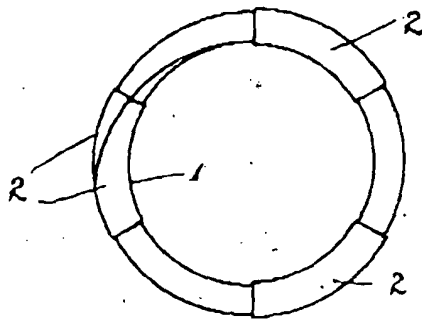


FIG. 5.

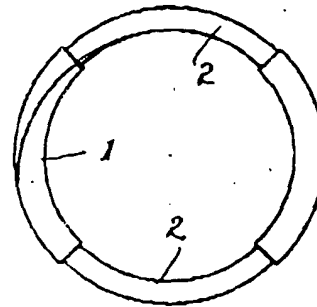
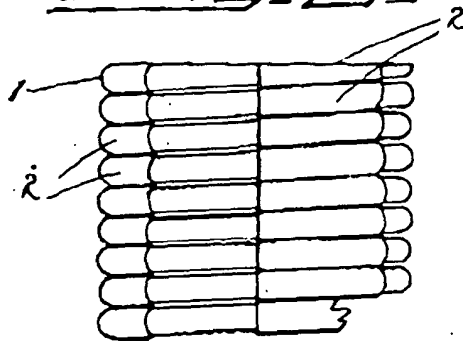


FIG. 3.



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[This Drawing is a reproduction of the Original on a reduced scale.]